

STATE OF ARIZONA

JANET NAPOLITANO
GOVERNOR

OFFICE OF THE GOVERNOR
1700 WEST WASHINGTON STREET, PHOENIX, AZ 85007

MAIN PHONE: 602-542-4331
FACSIMILE: 602-542-7601

October 6, 2008

The President
The White House
1600 Pennsylvania Avenue, NW
Washington, D. C.

To: Mr. Jerold Gidner, Director
Department of the Interior, Bureau of Indian Affairs
1849 C Street, NW
Washington, D.C. 20240

Through: Mr. Chris English
Department of the Interior, Bureau of Indian Affairs
Homeland Security/BIA WRO
2 AZ Center, Floor 12
400 N. 5th Street
Phoenix, AZ 85004

To: Chief R. David Paulison, Administrator
Department of Homeland Security, Federal Emergency Management Agency
500 C Street SW
Washington, DC 20472

Through: Ms. Nancy Ward, Regional Administrator
DHS/FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

Dear Mr. President:

In conjunction with the Havasupai Tribe, I respectfully request that the federal government provide any and all assistance required by the Havasupai Tribe ("Tribe") for physical and catastrophic economic losses from the flooding on Cataract Creek and the Havasupai Reservation on August 15 – 17, 2008. The flood has essentially destroyed the principal revenue source of the Tribe. At the onset of the flood, approximately six hundred tourists and residents were stranded in the Havasu Creek Canyon. The Tribe and multiple public safety agencies worked together evacuating tourists and tribal residents Saturday through Monday (August 16 – 18, 2008).

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I am also writing to the two federal agencies, the Department of the Interior, Bureau of Indian Affairs (DOI/BIA) and Department of Homeland Security, Federal Emergency Management Agency (DHS/FEMA), that will play a vital role in assisting the Tribe in their recovery from this flooding and preventing further economic and infrastructure destruction. The first line of assistance to tribal nations is the DOI/BIA and DHS/FEMA is the "last resort" for disaster relief funds.

The Havasupai Tribal Council declared a state of emergency on August 18, 2008 during a Special Tribal Council Meeting held in Supai, Arizona. The declaration was officially transmitted to FEMA Headquarters, Administrator R. David Paulison and his key Tribal Staff as well as FEMA Region IX, Administrator Nancy Ward and her key Tribal Staff on August 19, 2008. The DOI/BIA was also informed of the emergency and in fact participated in the initial public safety response and evacuation of tribal members and tourists from the canyon.

First, I ask the Department of the Interior, Bureau of Indian Affairs, to act consistent with its mission and commit to providing meaningful assistance in the long-term recovery efforts for the Havasupai Tribe. The Tribe has been devastated by the floods and much of their infrastructure, which forms the basis of their economic stability, is destroyed. On August 20, 2008 the DOI/BIA Truxton Canyon Agency began the damage assessment process. Their Budget Summary Report is attached with a total estimated cost of \$2,523,981.75 for recovery of public infrastructure and mitigation. Along with the DOI/BIA damage assessment report, the United States Army Corps of Engineers also conducted a damage assessment which is attached.

The Havasupai Tribe's total population documented by the U.S. Census Bureau, Census 2000 is 503 individuals. Based on these facts, the per capita cost and impact to the Havasupai Tribe is \$1,457.22 per capita. It is our understanding from the damage assessment report narrative that DOI/BIA has or will be providing \$350,000. These funds, once they reach the Havasupai Tribe, will provide a much-needed boost to the recovery efforts. However, we must still identify more than \$2 million in additional funding to cover the remaining costs as estimated by the DOI/BIA.

Second, I request Department of Homeland Security, Federal Emergency Management Agency to address this situation not as a statewide disaster, but as a **sovereign tribal nation** disaster. DHS/FEMA disaster relief funds are the funds of "last resort"; and we are at the last resort if DOI/BIA does not cover the total recovery costs. FEMA has established statewide thresholds of \$1.24 per capita, a county threshold of \$3.11 per capital, and a \$122 per capita threshold capita for recommending a cost share adjustment from 75% to 90% for Public Assistance. The cost per capita based on the DOI/BIA assessment is \$1,457.22 for the Havasupai Tribe, which is exponentially greater than any of the noted thresholds. Several times over the years, the federal government has ignored the sovereignty of tribal nations and denied them assistance based on statewide thresholds. As the impact of the flooding at Havasupai demonstrates, the per capita impact of these events can decimate tribal economies making comparisons to statewide thresholds inappropriate and misleading. Further, tying a tribal claim for assistance to a statewide threshold is incompatible with recognition of tribal sovereignty and federal trust responsibilities to federally recognized tribes.

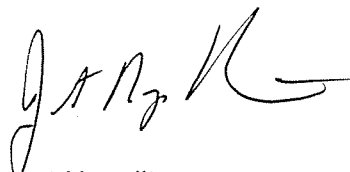
The President
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In response to the flooding, the state took appropriate action under State law and directed the Search and Rescue Contingency Fund to be executed to assist with resources and financial reimbursement for the public health and safety in evacuating the individuals from the canyon. I have also issued a declaration of emergency relating to this event, a copy of which is attached. On September 19, 2008 a Response After Action Meeting was conducted in Flagstaff, AZ with representatives of numerous tribal, federal, state, county and other agencies. A meeting has been scheduled on November 5, 2008 to discuss the follow-on actions with all the same partners as the Response After Action Meeting. We encourage your departments to provide immediate assistance to the Havasupai Tribe and request they attend the November 5th meeting and bring your support.

The Havasupai Tribal Council has expressed an interest in receiving direct technical assistance from FEMA with updating their Tribal Mitigation Plan that expired in May 2008. The State of Arizona has also offered to provide technical assistance to update their plan. The Havasupai Tribe has designated Thomas Siyuja as the Tribal Coordinating Officer for this request. He will work with the Bureau of Indian Affairs and the Federal Emergency Management Agency to coordinate assistance and provide further information or justification upon request.

I have determined that this incident is of such severity and magnitude that effective recovery is beyond the capabilities of the Havasupai Tribe and that supplementary Federal assistance is necessary. Therefore, under the provisions of Section 401 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5206 (Stafford Act), and implemented by 44 CFR § 206.36, I request that you declare a major disaster for the Havasupai Tribe as a result of intense thunderstorms dropping heavy rain over an area between the city of Williams and the Grand Canyon, resulting in significant flooding on Cataract Creek and the Havasupai Reservation (village of Supai).

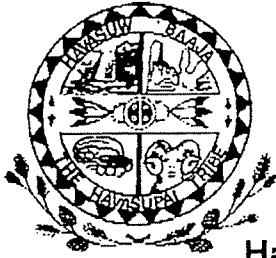
Yours very truly,

A handwritten signature in black ink, appearing to read "Janet Napolitano", with a stylized flourish at the end.

Janet Napolitano
Governor

Enclosures:

Declaration of Emergency – Havasupai Resolution No. 26-08
Governor's Emergency Declaration
Bureau of Indian Affairs Executive Summary
Bureau of Indian Affairs Budget Summary
United States Army Corp of Engineers Technical Study Report



HAVASUPAI TRIBAL COUNCIL

P.O. Box 10 • Supai, Arizona 86435
(928) 448-2731 • Fax (928) 448-2551

Havasupai Resolution No: 26-08
OF THE GOVERNING BODY OF THE HAVASUPAI TRIBE
OF THE HAVASUPAI RESERVATION
SUPAI, ARIZONA 86435

RE: DECLARATION OF EMERGENCY

WHEREAS, the calamitous damage and persisting recovery due to the High Water Event of this date poses a serious and immediate threat to health and safety of failure of Redlands Dam and the visitors and residents, as well as livestock and property in Supai Village, Havasupai Reservation, Coconino County, Arizona, and

WHEREAS, a majority of the tribal members livelihood stems from packing supplies for our tourism industry and US Mail Services; due to the damage done to the trails and campground this livelihood is heavily impacted, and

WHEREAS, the Havasupai Reservation is Indian Country as defined by 18 USC & 1151 and within the Territory of the United States of America, and


WHEREAS, the Havasupai Tribal Council in an Emergency Council Open Meeting finds that emergency conditions prevail and immediately threatens the health, life, safety, and welfare of the persons and property due to the failure of the Redlands Dam and a High Water Event is occurring requiring the remediation, recovery and disaster services of the United States, and

NOW, THEREFORE, IT IS HEREBY DECLARED AND ORDERED, that the Havasupai Tribal Council, the governing body of the Havasupai Tribe, Havasupai Indian Reservation, Coconino County, Arizona resolves that a state of emergency exists. The State of Emergency exists due to the failure of Redlands Dam and conditions from a High Water Event occurring on but not limited to Cataract Creek drainage and Havasu Creek. Therefore, the Havasupai Tribe seeks assistance and support in our request to the full extent of resources of the United States of America and the State of Arizona.

CERTIFICATION

The Havasupai Tribe is a federally recognized sovereign Indian Tribe organized pursuant to Section 16 of the 1934 Indian Reorganization Act. Pursuant to the authority of Article V, Section 1 of the Constitution and By Laws approved March 27, 1939, and amended on July 22, 1967, June 18, 1968, January 27, 1992, and November 2, 2005 the foregoing resolution is adopted this 18th day of August at a Special Tribal Council

Meeting held in Supai, Arizona, at which a quorum of 4 members were present; by a vote of 4 in favor; 0 opposed; 0 abstained; 3 absent.



DON E. WATAHOMIGIE
Chairman
HAVASUPAI TRIBAL COUNCIL

ATTEST:



Tribal Secretary
HAVASUPAI TRIBAL COUNCIL

*** DECLARATION OF EMERGENCY ***

Havasupai Reservation Flooding

WHEREAS, intense thunderstorms dropped heavy rain over the area of the City of Williams and the Grand Canyon from August 15-17, 2008; and

WHEREAS, the heavy rains resulted in significant flooding on Cataract Creek and the Havasupai Reservation; and

WHEREAS, approximately 600 tourists and residents were stranded in the Havasu Creek Canyon and search and rescue operations from multiple public safety agencies were called into action; and

WHEREAS, the Havasupai Reservation incurred in excess of \$732,000 worth of damages to its public infrastructure; and

WHEREAS, the devastating economic impact to the Havasupai Tribe will continue until the infrastructure is repaired and the canyon is re-opened to tourism trade; and

WHEREAS, the Governor is authorized to declare an emergency pursuant to A.R.S. § 26-303(D); and

WHEREAS, the Legislature has authorized the expenditure of funds in an event of an emergency pursuant to A.R.S. § 35-192;

NOW, THEREFORE I, Janet Napolitano, Governor of the State of Arizona, by virtue of the authority vested in me by the Constitution and Laws of the State, do hereby determine that the Havasupai Reservation Flood justifies a declaration of a State of Emergency, pursuant to A.R.S. § 26-303(D), and I do hereby:

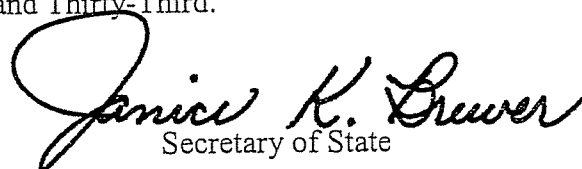
- a. Declare that a State of Emergency exists on the Havasupai Reservation due to the Havasupai Reservation Flood, which occurred during August 15-17, 2008; and
- b. Direct all state agencies with resources available to support the Havasupai Tribe coordinate with it in accordance with their department Tribal Consultation Policy; and
- c. Encourage the federal government to provide the necessary economic and infrastructure recovery as written in my letter of September 29, 2008 to the President of the United States.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Arizona


GOVERNOR

DONE at the Capitol in Phoenix on this 6th day of October in the Year Two Thousand Eight and of the independence of the United States of America the Two Hundred and Thirty-Third.

ATTEST:


Secretary of State



EXECUTIVE SUMMARY

On the afternoons of August 15th-17 2008, the peak tourist season on the Coconino/Colorado River Plateau, thunderstorms dropped heavy rain over an area between the city of Williams and the Grand Canyon, resulting in significant flooding on Cataract Creek and the Havasupai Reservation (village of Supai). Total rainfall for the period from Friday the 15th through Sunday the 17th was generally light in the Supai area, but as high as 4 to 6 inches within the Cataract Creek Drainage 20 to 40 miles southeast of Supai on the Coconino Plateau (as estimated by National Weather Service Doppler radar). As this water collected in the Cataract Creek drainage, it lead to significant flooding, breaching of Redlands Dam at the head of Cataract Creek, and the collapse of Fifty Foot Falls on Havasu Creek. The creek channel over Navajo Falls shifted east, drying them up. The Havasupai Tribal campground below Havasu Falls was inundated with approximately 450,000 cubic yards of rock, soil and woody debris.

Approximately six hundred tourists and residents were stranded in the Havasu Creek Canyon. The Tribe and multiple public safety agencies worked together evacuating tourists and flood residents Saturday through Monday (Aug 16-18th).

The Hualapai Trail into Supai Village suffered minor damage. Three homes suffered water damage in the village, the Tommy Sayuga and Burro bridges were damaged, and the irrigation system was silted in. 1600 feet of trail adjacent to Fifty Foot Falls was destroyed or damaged. The bridge to Havasu Falls was destroyed, the Tribal Enterprise campground trail wiped out, and more than six feet of soil and debris were deposited in the campground. Two tribal cemeteries became further threatened by erosion and potential collapse. Mooney Falls lower pool was filled with sediment and woody debris deposited on shorelines, Beaver Falls flowed muddy.

Bureau of Indian Affairs Regional Director Allen J. Anspach and Truxton Canon Agency Superintendent James Williams visited the Tribal Council on August 18 to determine tribal technical assistance needs. Based on the discussion, a Supai Flood 2008 Recovery Evaluation Team was mobilized. The team arrived in Valentine, Arizona the evening of August 20, 2008, had an in-briefing with the Agency Superintendent and drafted a Delegation (Delegation) of Authority. On August 21, the team met with the Havasupai Tribal Council, finalized and signed the Delegation and began the damage assessment process.

The primary technical objectives of the 2008 Supai Flood Evaluation Team are:

- Evaluate the trail from Hualapai Hilltop to Supai.
- Evaluate the trail from Supai to Mooney Falls, creating initial restoration recommendations and plan.

- Evaluate fencing lost to flooding, creating initial restoration recommendations and plan.
- Evaluate previous campground conditions and flooding damage, creating initial recommendations and restoration plan.
- Make an initial geologic and hydrologic evaluation and make suggestions for restoring Havasu Creek to world-class recreation standard.
- Evaluate irrigation system damages, creating initial restoration recommendations and restoration plan.
- Contact Babbitt Ranch regarding establishment of a flood early warning system at the head of Cataract Creek and learn the status of the web-mapped Remote Automated Weather System (RAWS) and its future operational status.
- Make an initial cemetery stabilization assessment.

Resource assessments produced by these specialists can be found in Appendix I and treatments identified in the assessments can be located within Part F, Specifications. A summary of treatment costs is located within Part E. A signature page for review and approval is located in the front of the plan. Appendix II contains the National Environmental Policy Act (NEPA) compliance summary for all recommended treatments. Appendix III contains ESR Plan maps while Appendix IV contains photo documentation of flood effects. Appendix V contains supporting documentation.

Havasupai Indian Reservation

The impacted area is located on the Havasupai Indian Reservation, Coconino County, Arizona. This area is the homeland of the Havasupai 'Baaja, "People of the Blue-green Water." The turquoise waters of Havasu Creek plunging over Navajo, Fifty Foot, Havasu, Mooney and Beaver Falls attract approximately 30,000 visitors a year from across the planet who hike, ride horses or helicopter the 7.3 miles to the Supai community from Hualapai Hilltop. They may stay in the 24 room tribal hotel. They travel another 2 miles by foot or horse to swim in the pools below the falls and camp in Tribal Enterprise campgrounds between Havasu and Mooney Falls. Further use of this area includes hunting, livestock grazing, and the activities necessary to support the Havasupai way of life. The April 22, 2005 "Plan to Reduce Harm from Hazards to the Havasu Baaja" identifies living in Havasu Canyon and on the Coconino Plateau as the number one priority. The number two tribal goal is to lessen risks and avoid losses associated with a variety of hazards. Flooding is the primary threat identified.

The August 17, 2008 flood incident is the 17th flood since 1898. The flow of water in Havasu Canyon produces a flood of tourists depending on helicopter, mule and horse transportation to the falls at a cost of \$85.00 or \$60.00 for each leg of the trip and a visitor's fee of \$35.00. A stay in the Havasupai Lodge is \$145.00. Camping is \$17.00 per night with an additional \$5.00 environmental care fee. This flow of tribal income ceased on August 15. In an August 20 news article in the Arizona Republic, Billy Jack with the tribal tourism office reported camping generates \$2,000,000 of annual income for the Tribe. As the Flood Recovery Evaluation Team prepared to leave the area on August 25, the Hualapapai Lodge at Peach Springs was beginning to consider laying off employees due to reservation cancellations because people could not enter Havasu Canyon. The effect on the regional economy when Havasu Falls is inaccessible is unknown at this time.

Flood Background

The National Oceanographic and Aviation Administration, on its Flagstaff Arizona web page states,

"On the afternoons of August 15-17 2008 thunderstorms dropped heavy rain over the area between the city of Williams and the Grand Canyon, resulting in significant flooding on Cataract Creek and the Havasupai Reservation (village of Supai). Total rainfall for the period from Friday the 15th through Sunday the 17th was generally light in the Supai area, but as high as 4 to 6 inches within the Cataract Creek Drainage 20 to 40 miles southeast of Supai on the Coconino Plateau (as estimated by National Weather Service Doppler radar). As this water collected in the Cataract Creek drainage, it lead to significant flooding...."

During daylight hours, water entering Havasu Creek from a side canyon turned the water below the Havasu Falls pool. Flood scent was in the air. Rangers began warning campers that flooding was likely and they should move to higher ground. At 10 PM Saturday August 16, the first major floodwaters entered Supai Valley raising Havasu Creek several feet. Notices were provided to BIA Law Enforcement and Coconino County. Tribal Search and Rescue went to work, helping stranded tribal members cross the swollen creek to high, dry ground. Tribal Rangers used all communication methods available to them continued to notify campers about the flood. The creek completed a jump from its channel over Navajo Falls sending its full volume toward Fiftyfoot and two unnamed gullies, poured down the channel, over Havasu Falls and into the campground. Campers climbed to high ground, many to a cemetery site or climbed trees to safety. Downstream, at Havasu Creek's confluence with the Colorado River, the rafts of 16 river tourists washed into the river, leaving them stranded. In the night, Fifty Foot Falls eroded and approximately two acres of fifty foot tall earth, rock and covering vegetation went down canyon. The torrent cut away weak

soils to the east, tearing out and further weakening a quarter mile of trail, scoured the creek bed to Havasu Falls, carried away the bridge and tore away a piece of the Havasu Fall's water gap. Mud, rock, vegetation and tree pieces filled the basin below the falls, tearing away the structure of the pool, pouring thousands of cubic yards of material into the widened stream channel where the campground lay. Slowing because the channel widened and backing because a dam of wood and debris collected where the canyon narrowed at Mooney Falls, the heaviest part of the sediment settled up to six feet deep around and over picnic tables, porta-potties and composting toilets, the rest roaring over Mooney, filling the pool with flood debris, plastering ladders, chains and signs with red mud, painting 250 vertical feet of cliff wall with red mist a quarter mile downstream. The bed load tore things up some more going down the canyon, passed over Beaver Falls, poured into the Colorado. It was reported that the causeway at the head of Catarack Creek, on the Redlands Ranch, breached at 6 AM Sunday, August 17. Helicopters flew into action at the earliest opportunity, lifting tourists, campers and tribal members to safety. By Sunday afternoon, pictures taken by a tribal member from a helicopter were on the web showing Mooney Falls running mud, the basin of Havasu Falls full of mud and debris, Navajo Falls no longer running water and the re-channeled creek cutting an immense gully in the former Fiftyfoot Falls location. Airlift of the stranded tourists and residents continued until dark. Eighty seven campers remained in Supai on the evening of August 17 and the tribe housed them on the Supai basketball court, providing them with blankets, baloney sandwiches and water. They were airlifted to safety August 18, while law enforcement staff and tribal officials compared permit paperwork with airlift names. By August 20 it was determined that all were accounted for and unharmed. Havasu Creek flowed clear and fast to Mooney Falls.

Resource Damages and Threats to Human Safety and Resources

After the flooding of 2005, the Federal Emergency Management Agency (FEMA) funded the *"Plan to Reduce Harm from Hazards to the Havasu Baaja"* (Hazard Plan) supplementing the existing draft Havasupai Emergency Operations Plan. As mentioned previously, the Tribe's second highest priority is "Lessen risks and avoid losses" with flooding as the number one prevention priority. Components for reducing flood hazards included "Improve Prediction and Warning, Improve Response Capabilities, Teach Children (and Rangers) Life Saving. Alternative Actions include, "Install Disaster Resistant Bridges and Protect most Vulnerable Homes on West Side." EPA then funded the Tribe to restore damages from the flood.

A collection of images taken by Byron Manakaja can be found on the DVDs supporting this document. They were taken to depict the Tribe's completion of bridge and gabion installation and other tasks for FEMA reports. The sewer line to the west side was protected with gabions, the irrigation turnout and several homes along the creek channel were gabion-armored. Some damaged trails were gabion armored. Bridges were constructed to give way before floodwaters. Tribal members got swift water rescue and extraction training.

The approximately \$800,000, 2005 FEMA flood recovery investment applied using Hazard Plan goals produced a large payoff in 2008. There was slight damage to village infrastructure. Power, phone and water services were not lost. Three homes were slightly flooded. South of the village two bridges had their approaches wash away and slight structural damage. The irrigation system silted up but was not damaged. Some underground electrical conduit was exposed. The Havasupai Search and Rescue team members using techniques learned in training prevented loss of life and injury in the village.

No lives were lost or people injured and humankind got away lucky in the August 16, 2008 Havasu Creek flood.

The erosion of Fifty Foot Falls produced a head cut traveling up to 400 feet closer to Supai Village. This is an alarming geologic event because the number one tribal goal is living in Havasu Canyon forever.

Havasus Creek changed its course, drying up Navajo Falls for the time being while cutting a new channel and falls to the east.

Most tribal income ceased with the flood. Destruction of Fifty Foot Falls trail and the campground assured a longer than usual lapse of income.

Because there have been 17 floods in Havasu Creek since 1898, and much work done between 1988 and the present, pre-existing NEPA and Threatened and Endangered Species Act documentation exists for similar work. See Appendix II

for previous assessments. The team brought no NEPA Specialist due to their being busy with other emergency operations. All activities proposed within this plan comply with applicable laws and executive orders. If further Federal actions result from further investigations, appropriate NEPA documentation will be created in a timely manner.

Cultural

Soon after the team began meeting with the Havasupai Tribal Council concern was expressed for the Burro, Paya, and other cemeteries perched above the creek. Ongoing floods are eroding the rock and soil terraces where the cemeteries lie. We told the tribe we would evaluate preservation techniques. The Park Service Trails Evaluation completed by Bill Allen, Lead Trail Supervisor, Grand Canyon National Park recommends abandoning the east side trail and improving the west side trail. The public was previously allowed access to this trail but wandered inappropriately and removed cultural artifacts. This presents a dilemma for the tribe because the same thing will likely happen if the main travel route is shifted west.

Implementation

Based on ground survey the Team identified the following treatments for implementation with an initial cost estimate of \$2,523,981.

- Informational and Warning Sign Replacement
- Replace Missing Gabions at Mile Marker 6.2
- Earthen Dam at Mile 6.3
- Repair Pedestrian Bridge at Mile 6.4
- Repair by Rough Grading Hiking Trails and Removal of Debris
- Trail Closure
- Temporary Bridge Replacement Havasu Falls
- New Bridge Havasu Falls
- Diversion Gate Cleaning and Repair
- Irrigation Corrugated Metal Pipe (CMP) Cleanout
- Irrigation Ditch Cleaning

- Fence Repair Supai Community and Havasu Creek
- Camp Ground Picnic Table and Squirrel Poles
- Woody Debris Removal Havasu Creek
- Public Safety Early Warning System
- Geotechnical Analysis Havasu Creek
- Campground Repair Toilet Compost Cleanout
- Potable Water System Replacement
- Trash Removal

The Team and Agency Superintendent conducted a closeout presentation to the Havasupai Indian Tribe on September 3, 2008 providing findings and identifying proposed treatments.

BIA Budget Summary

Activity	Implementation Method	Estimated Cost
#1 Information and Warning Sign Replacement	Local Labor	\$6,025
#2 Replace Gabions at mile 6.21 near 24" CMP	Local Labor	\$11,319
#3 Construct Earthen Dam (Berm) at mile 6.30	Local Labor	\$464
#4 Repair Pedestrian bridge at mile 6.4	Local Labor	\$10,734
#5 Rough Grade Hiking Trails and Debris Removal	Local Labor	\$4,645
#6 Trail Closure	Local Labor	\$1344.75
#7 Temporary Bridge Replacement	Local Labor	\$34,270
#8 Construct New Bridge	Local Labor	\$325,000
#9 Diversion Gate Cleaning and Repair	Local Labor	\$1,070
#10 Irrigation Corrugated Metal Pipe (CMP) Cleanout	Local Labor	\$1,540
#11 Irrigation Ditch Cleanup	Local Labor	\$7,930
#12 Fence Repair-Supai Community and Havasu Creek	Local Labor	\$8,534
#13 Campground Picnic Table and Squirrel Pole Replacement	Local Labor	\$100,000
#14 Woody Debris Removal Havasu Creek	Local Labor	\$101,546
#15 Public Safety Early Warning System	Contractor	\$1,791,000
#16 Geotechnical Analysis of havasu Creek	Contractor	\$100,000
#17 Composting Toilet Cleanout	Local Labor	\$4,800
#18 Potable Water system Replacement	Local Labor	\$7,200
#19 Trash Removal	Local Labor	\$7,100
Total Estimated Cost		\$2,523,981.75

All of the above information is quoted from the Supai Flood 2008 Flood Damage Recovery Plan dated August 31, 2008 produced by the Bureau of Indian Affairs, Western Region. A detailed project worksheet corresponding with each item number is enclosed in the report.

BIA (Chris English) has advised that some of the figures referenced above may be revised but he has not received any actual updates as of yet. As of this date, the BIA has obligated \$350,000 to be applied mostly to campground restoration. Miles 0 through 8 of the Hualapai Hilltop to Supai trail is an official part of the BIA roads system, BIA Route 18. There may be 30K applied to these miles if a transportation budget line item has 30K in it. Mile 8 to Mooney Falls is scheduled to be added in the next roads system updates. At this point, no BIA or Federal Highways Emergency Recovery funds can be applied to

the trail that is damaged, unsafe and needing engineering analysis. There is no federal "nail" to hang justifications on for further analysis, engineering or construction.

Arizona Department of Water Resources (ADWR) has offered to Coconino County and the National Weather Service (NWS) the installation of ALERT gauges to improve the ability to predict flooding and reduce the major uncertainties. The NWS is reviewing a 1995 USGS draft flood warning plan to determine the best areas where additional real-time information would assist their forecasting. Following the NWS needs assessment, ADWR indicates that they will move quickly to coordinate with the necessary entities for the installation of the equipment.

ADWR has advised that they have seven rain gauges in-stock with capability to monitor stream flow. Each can be installed for a cost of \$1000. If additional gauges are needed, ADWR indicated that it will take approximately 3 weeks to receive them from the vendor at a cost of approximately \$7000 per gauge. ADWR has also identified a "Longer-Term Flood Warning System" utilizing USGS satellite-based gauges. USGS and BIA are discussing this approach. ADWR has indicated that they will assist in this effort.

The Arizona Geological Survey has offered their assistance. They propose to send a geologist to conduct a reconnaissance of the flood-affected areas, meet with Tribal staff and advisors, and to prepare an assessment of what additional geologic work may be needed to answer questions, understand changes to the canyon, and address potential hazards. This assistance is pending approval of the Tribal leadership.

Arizona Division of Emergency Management has coordinated with FEMA to have the Havasupai Tribe participate in an existing grant to update their hazard mitigation plan that has expired. The mitigation office is waiting on a commitment letter from the Tribe to move forward with this process. ADEM has attempted to coordinate the agencies offering or providing assistance to the Havasupai Tribe primarily as an information conduit so everyone is operating with the same "factual" information.

MEMORANDUM FOR Record

SUBJECT: Trip Report, Site Visit, Havasu Creek, Supai, Havasupai Indian Reservation, AZ, on 04-05 September 2008.

SCOPE AND AUTHORIZATION.

1. This Memorandum for Record documents the observations of current conditions and damages along portions of Havasu Creek, in the vicinity of Supai, Havasupai Indian Reservation, Arizona, due to a series of afternoon thunderstorms in the upper Havasu Creek drainage basin on Friday through Sunday, 15-17 August 2008. A preliminary assessment is made of potential future concerns and issues that need to be addressed and initial recommendations are made.

2. On Monday, 25 August 2008, the Emergency Operations Center requested an Engineer division team be assembled and make preparations to visit the site, assess the situation, and provide technical assistance. The engineering team left the Los Angeles District office on Wednesday, 03 September 2008, spent the night in Kingman, AZ, and arrived in Supai on Thursday morning, 04 September 2008. The engineer team met the Construction division representative en route to Supai. The complete team consisted of:

Robert Castle	CESPL-ED-HH	Hydraulics
Greg Dombrosky	CESPL-ED-GD	Geotechnical
Paul Stears	CESPL-CO-AN	Construction

3. The team had an in-briefing on the morning of Thursday, 04 September 2008, with Don Watahomigie, Havasupai Tribal Chairman, and Thomas Siyuja, Sr, Emergency Response Coordinator, during which time they provided an overview of the tribe's major areas of concern. Edmond Tilousi, Natural Resources Coordinator, provided access to and background on the various areas of concern on Thursday afternoon and Friday morning. The team had an out-briefing with Mr. Watahomigie, Mr. Tilousi, and Coleen Kaska, Tribal Council, on Friday afternoon, 05 September 2008, outlining some of our observations and preliminary recommendations. Some areas were not accessible by the team on foot and were observed from the air on the helicopter ride out.

BACKGROUND.

4. Havasu drainage is the second largest tributary of the Colorado River in Grand Canyon National Park, Arizona (See Figure 1). The lower portion of the drainage is located within the Havasupai Indian Reservation. The Havasupai village of Supai is located in a relatively wide reach of Havasu Canyon, bounded on both sides by nearly vertical rock walls that extend several hundred feet to the plateau above (See Figure 2). The only means of access to the village are an

16 September 2008

SUBJECT: Trip Report, Site Visit, Havasu Creek, Supai, Havasupai Indian Reservation, AZ, on 04-05 September 2008.

8.5-mile hiking trail or helicopter. Supai is the only community in the United States that gets its mail by mule train. Currently the Havasupai Tribe is comprised of about 650 enrolled tribal members, approximately 500 of whom live in Supai. Tourism is the Tribe's most important industry. Because of its unique scenery, Havasu Canyon is a primary destination for many tourists visiting the Grand Canyon region. The area's popularity as a backcountry destination has increased steadily since 1970. With increasing tourism in Arizona and the southwestern United States, demand for recreational use of Havasu Canyon can also be expected to increase. Backpackers hiking to Havasu Canyon from Hualapai Hilltop typically spend one or more nights in the lodge or the campground between Havasu and Mooney Falls.

5. Tribal income from tourists is primarily through the campground and the lodge. The campground capacity is 200 people per night. The lodge has 24 rooms which hold on the average 3 to 4 adults per room. January and February are the only months that the lodge and campgrounds are not booked solid meaning that it is not uncommon for about 300 tourists to be in residence in the canyon at any given time. Planned expansions of the lodge will push this number even higher. Over 30,000 tourists visit the canyon generating about \$2,000,000 income each year. Supai and its infrastructure are presently closed to tourists due to damage from the August 2008 flood. Most tribal income ceased until repairs can be made primarily to the campground and access trail downstream of the Village.

6. Havasu Creek drains an area upstream of Supai of approximately 2,600 square miles. The headwaters are near Williams, Arizona and most of the drainage area is thin, poorly developed soils over limestone that supports desert grassland and upland pinyon-juniper woodlands. Numerous small reservoirs and livestock tanks throughout the Havasu Creek drainage basin provide public and livestock water supplies. The town of Williams manages five reservoirs in the headwaters. While Havasu Creek is ephemeral throughout most of its length, about three miles upstream of Supai, Havasu Springs discharge a steady flow of approximately 70 cfs to the creek. The springs issue from the Redwall Limestone and are the main groundwater discharges from the "Coconino Trough" structural feature (Cooley, 1963). The spring flow is heavily mineralized and forms spectacular travertine features in the stream channel. Larger waterfalls, such as Havasu and Mooney Falls, are relatively permanent features of Havasu Canyon and are controlled by the combination of Redwall Limestone and massive travertine deposits. The Havasu Creek and thus the Supai Village are subject to flooding from summer thunderstorms and winter storms. There have been 17 significant floods in the watershed since 1898.

STORM EVENT.

7. A series of heavy thunderstorms moved through the Havasu watershed on 15-17 August 2008, dropping up to 6 inches of rain in limited areas (See Figure 3). The storms resulted in a "flash flood" in the vicinity of Supai village in the early morning of Sunday, 17 August 2008, that required the emergency evacuation of the village and a popular campground downstream

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from the village. Redlands Dam, located approximately 50 miles upstream from Supai, also failed Sunday morning but does not appear to have been a significant factor to the flows impacting the village.

8. A FEMA funded study called "Plan to Reduce Harm from Hazards to the Havasu Baaja" was implemented after a flood in 2005. As a result there were no injuries nor lives lost and very minor damage to the village and its infrastructure in the August 2008 flood. Some of the Havasupai tribal facilities damaged or threatened by erosion include:

- Trails-The Hualapai Trail into Supai Village suffered minor damage and downstream of the village 1600 feet of trail adjacent to Fifty Foot Falls was extensively damaged by an earth slide.
- Campgrounds-The tribal campground below Havasu Falls was inundated with approximately 450,000 cubic yards of sediment and woody debris to a depth of about six feet.
- Bridges-The two bridges to Havasu Falls were destroyed. The Tommy Sayuga and Burro Bridges were damaged.
- Irrigation-The irrigation system was filled with silt.
- Cemeteries-Several cemeteries perched on banks above the creek are in danger of damage from on- going bank erosion.
- Supai Village-Three homes suffered minor water damage.
- Falls-Fifty Foot Falls was eroded producing a head cut travelling up to 400 feet upstream toward the village, Navajo Falls is dry due to the creek changing course, and the Mooney Falls lower pool was filled with sediment.

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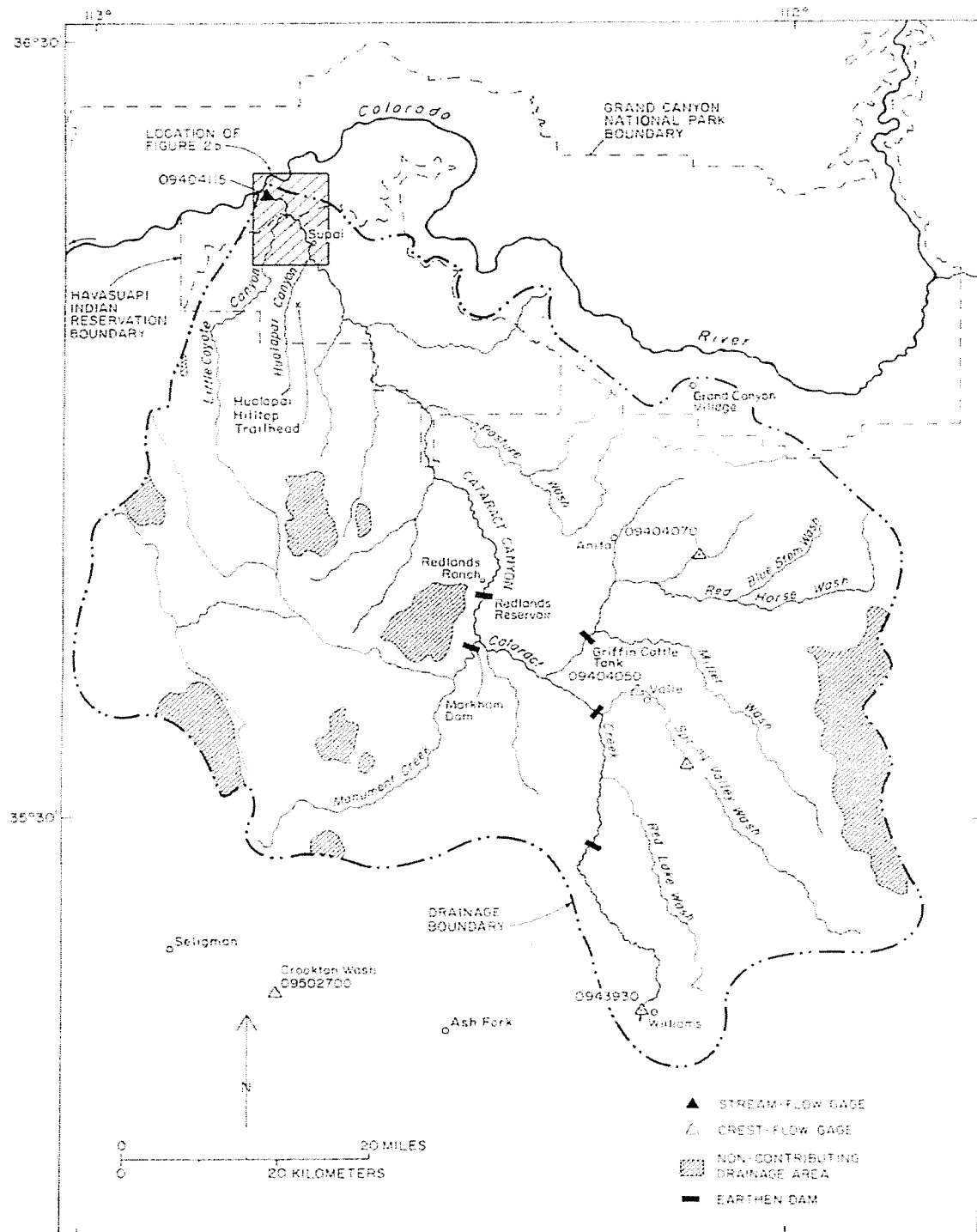


Figure 1. Havasu Creek Watershed (USGS, 1996).

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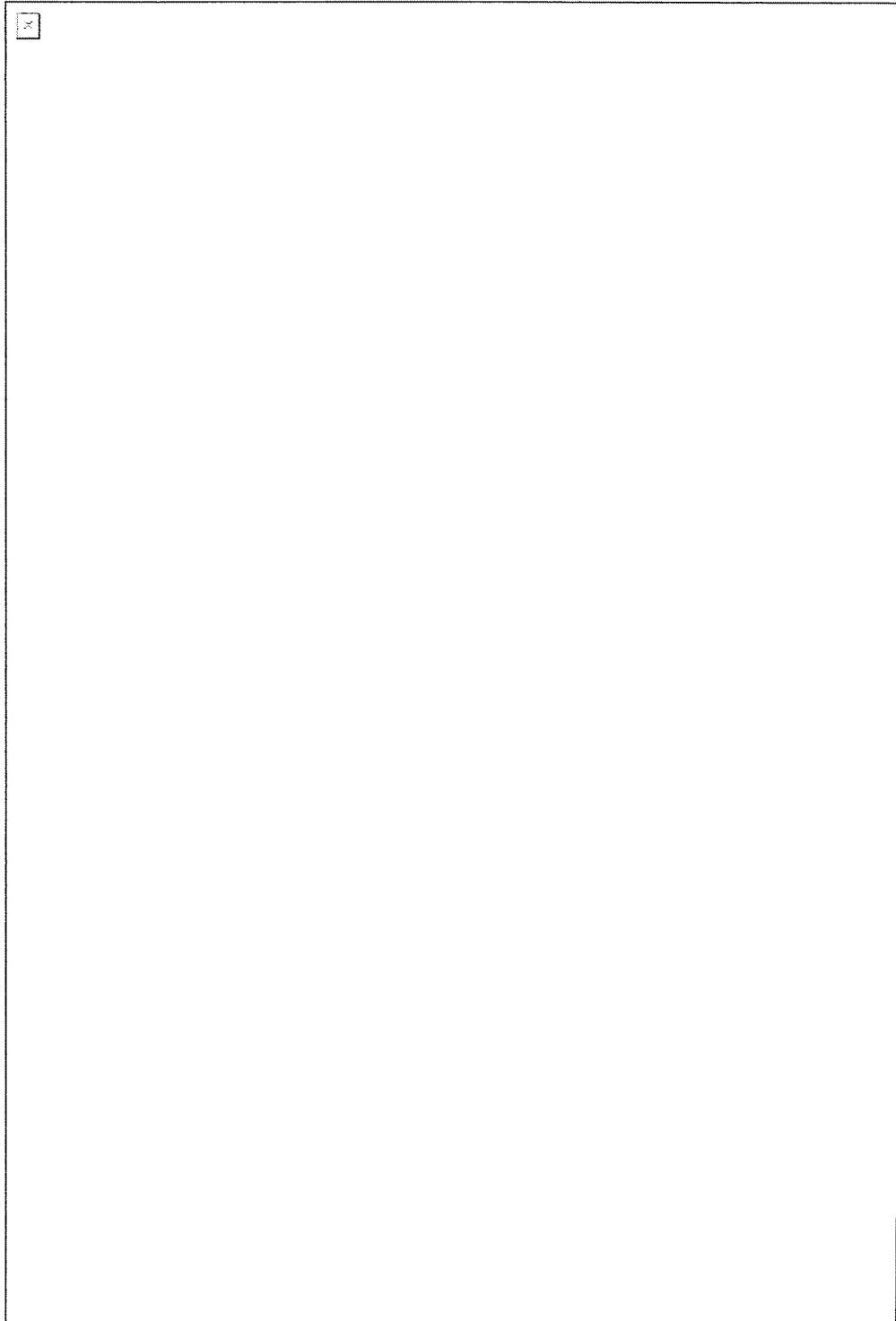


Figure 2. Supai Village and Vicinity.

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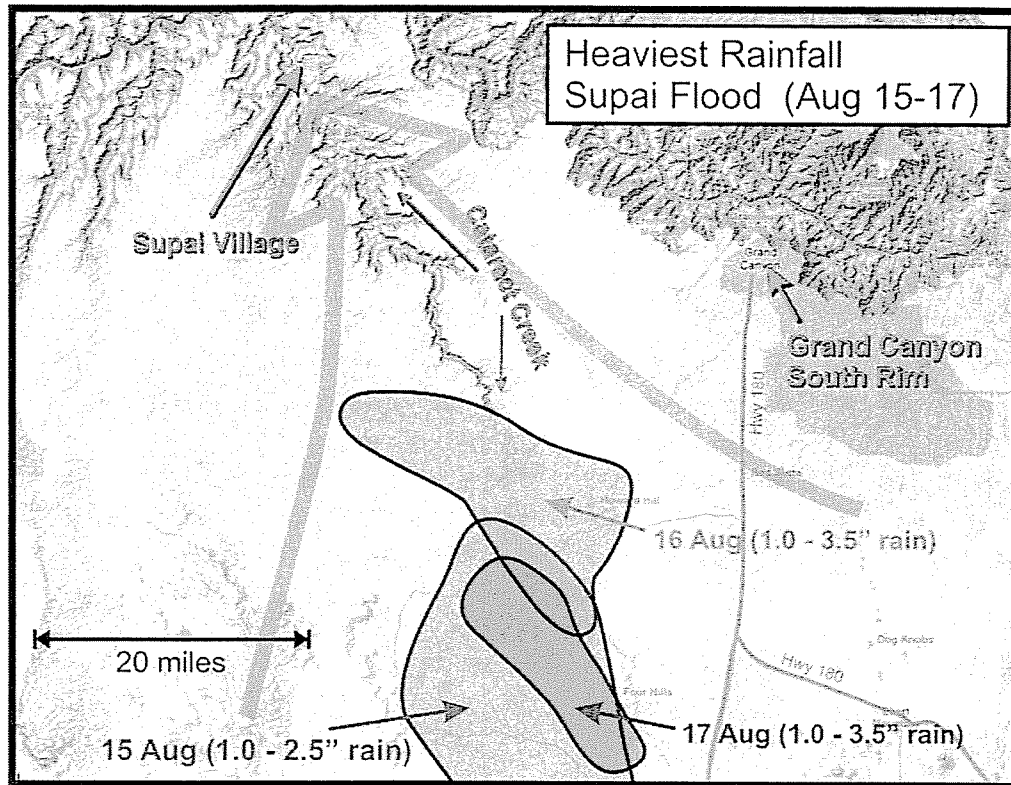


Figure 3. Estimated Rainfall Amounts, 15-17 August 2008 (NWS, undated).

DAMAGES AND PRELIMINARY RECOMENDATIONS.

9. Trails.

- a. The Hualapai Trail upstream of Supai Village was damaged by the meandering of the Havasu Creek and can be restored by grading and restoring the previous alignments of the creek.
- b. The trail adjacent to Fifty Foot Falls has been damaged be an earth slide. The trail can be temporarily relocated above the slide area or to the opposite side of the creek. Permanent repair should include stabilizing the slide area which would involve geotechnical analysis, and groundwater analysis.

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10. Campgrounds.

- a. The campground downstream of the village was damaged by deposition of sediment and wood-type debris. A short-term solution is to remove the wood debris and grade the recently deposited sediment into a new campground.

11. Bridges.

- b. The bridges upstream of the village can be repaired by regrading the approaches and any other minor repairs needed.
- c. The bridges downstream of the village need to be rebuilt. One bridge is either buried in silt or washed away and should be excavated. One abutment of the other bridge needs repair and the deck needs to be replaced. The approaches need replacing.

12. Irrigation. The irrigation systems need to be cleaned of sediment deposition.

13. Cemeteries.

- a. Two cemeteries are threatened by future erosion along the banks of Havasu Creek. The first one downstream from Supai is located on east side of the canyon, east of Navajo falls, and has already been relocated once due to the heavy erosion between Fifty Foot falls and Navajo falls. See Photo 1. Since it is located up on the talus slope and the material between the cemetery and the creek appears to be fairly resistant to erosion, there does not appear to be an immediate threat. However, the rate of erosion of the vertical face adjacent to the creek should be monitored so the cemetery can be relocated if necessary.

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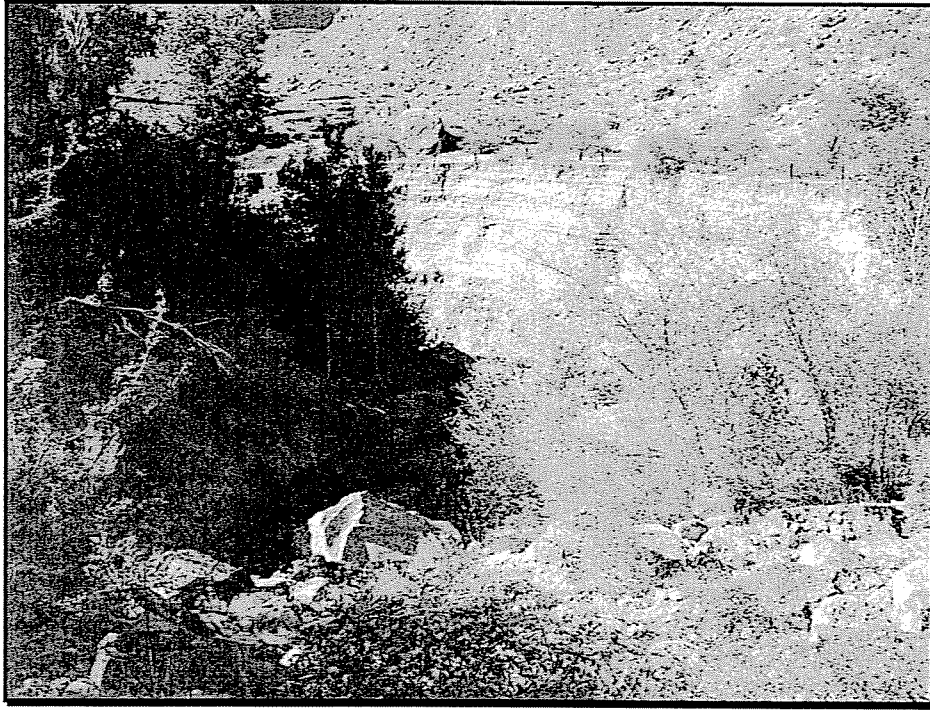


Photo 1. View looking downstream between Fifty Foot and Navajo falls. Cemetery is located to the right and upslope from the large boulder on the far bank.

- b. The second cemetery is located downstream approximately 0.25 miles on the west side of Havasu Creek. This cemetery is in immediate danger due to erosion of the creek bank during another heavy flow, especially, since this is the area that had significant deposition of sediments on the east side of the creek, narrowing the creek significantly. See Photo 2. It is suggested that several large boulders currently in the creek be placed near the toe of the slope and smaller stone and gravel be used to fill in the spaces between the boulders. This would be a short term solution. A more permanent solution would require excavation in the creek for sufficient “toe-down” to prevent undermining of the slope protection, a “tie-in” upstream so that the slope protection would not progressively fail in a downstream direction, and a type of slope protection that can withstand the high velocity, high volume flows. Furthermore, an evaluation would need to be made regarding the potential flows to overtop the creek bank in the vicinity of the cemetery.

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Photo 2. View of Creek Bank adjacent to the Cemetery downstream of Navajo Falls. Cemetery is located on the far bank behind the fence.

14. Supai Village.

- a. The current flood event caused relatively minor damages to the village of Supai, causing flooding to several homes. However, historically Supai has been heavily damaged by floods and remains vulnerable to future events.
- b. A potential significant impact to Supai is the erosion occurring downstream from the village. As described above, this erosion has created Fifty Foot falls and is moving in an upstream direction towards the village. However, the presence of Fifty Foot falls indicates that the erosion has encountered more erosion resistant rock and may be relatively stable at this time. See Photo 3.
- c. Recommend that the competency of the rock in the vicinity of and upstream from Fifty Foot falls be investigated to determine erosion rates. If the rock between the village and Fifty Foot falls is similar to what was eroded downstream of Fifty Foot falls, erosion toward Supai could proceed at a rapid rate once the erosion resistant rock currently present is removed.

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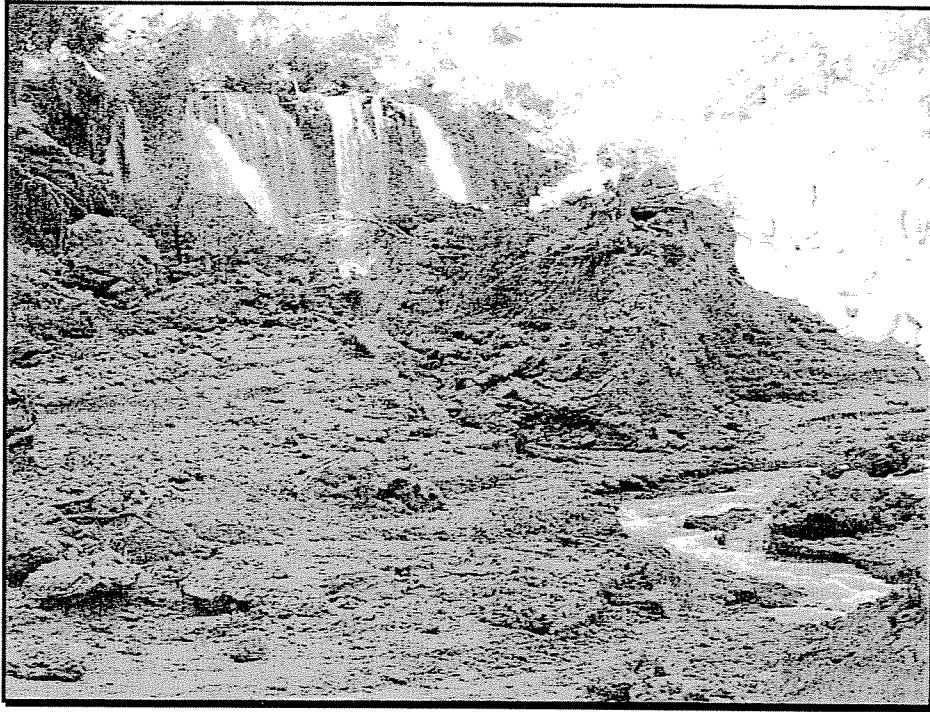


Photo 3. Fifty Foot Falls looking Upstream Over Recently Eroded Area.

15. Long Term Recommendation.

- a. A potential long term solution that would address all of the damages and future damages described above is the placement of a detention basin upstream from Supai. The purpose of the basin would be to “knock the peak off” of future flood events, reducing flows to levels that would not cause significant damage. A much more detailed study would be required to select a suitable location, determine storage and discharge capacities, and evaluate if environmental impacts to both Havasu Creek and the Colorado River are acceptable.
- b. A relatively inexpensive measure would be to install one or more telemetry rain gages in the upstream watersheds.

SUMMARY.

16. On Sunday, 17 August 2008, a “flash flood” in and around the Havasupai village of Supai resulted in the emergency evacuation of about 400 residents and campers. Flows increased to approximately eight feet above normal flows, overtopping the

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natural creek banks causing damage to infrastructure and some homes. This memorandum presents several recommendations for immediate implementation. In addition, a potential long term solution consisting of an upstream detention basin is discussed briefly.

Gregory A. Dombrosky
Soils Design and Materials Section
Engineering Division
Los Angeles District

Robert U. Castle
Hydraulics and Hydrology Section
Engineering Division
Los Angeles District

Paul J. Stears
Construction Division
Los Angeles District
US Army Corps of Engineers

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